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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/632,857 | 08/04/2000 | David F. Sorrells | 1744.0630002 | 2270 |

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| EXAMINER | |
|---|---|
| SHAH, CHIRAG G | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2664 | |

DATE MAILED: 09/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/632,857 | SORRELLS ET AL. | |
| | Examiner | Art Unit | |
| | Chirag G Shah | 2664 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *06 June 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-4,6-16,18-22,24-26 and 28-60* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6,8,28,32,34,36,42 and 46-56* is/are rejected.

7)☒ Claim(s) *7,9-16,18-22,24-26,29-31,33,35,37-41,43-45 and 57-60* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 6.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Objections*

1. Claims 34 and 36 objected to because of the following informalities: Claim 34 and 36 are identical with common dependence. Appropriate correction is required.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims1-4,6,8,28,32,42 and 46-56 rejected under 35 U.S.C. 103(a) as being unpatentable over Ohta et al. (U.S. Patent No. 6,600,795), hereinafter Ohta in view of Lee et al (U.S. Patent No. 5,636,140), hereinafter Lee.

Referring to claim 1, Ohta discloses in figure 1 of a wireless local area network (WLAN) device (receiver of figure 1) comprising, a receiver, physical layer device (receiving circuit having an antenna 1 (MAC) as in figure 1) that receives an input radio frequency (RF) signal, wherein the receiver comprises a universal frequency down-conversion (UFD) module (first frequency converting circuit 2 of figure 1), and a transmitter that transmits an output RF signal (filter 8A that transmits baseband output). Ohta fails to explicitly disclose the receiving circuit (WLAN) comprising: a medium access control layer; and a physical layer coupled to the MAC layer, comprising: a physical medium dependent sublayer; a physical layer convergence

procedure sublayer coupled to the physical medium dependent sublayer, wherein the physical layer convergence procedure sublayer controls frame exchange between the MAC and the physical layer. Lee discloses in column 3, lines 5 to column 4, lines 27 and in figures 2a and 2b that PHY data is generated by the physical device , which in WLANs, include radio; the current MAC devices are designed to either generate and receive both PHY data and MAC data to accommodate one type of radio or to generate and receive MAC data only to accommodate the other type. The MAC device can be configured to generate both PHY data and MAC data as in figures 2A. In addition, Lee discloses in column 2, lines 54 to column 3, lines 37 that IEEE standard 802.11 defines several frame formats called the physical layer convergence procedure (PLCP) for transferring data between a MAC device and a radio. The PLCP frame formats provides for the asynchronous transfer of MAC layer information form any transmitting station to all receiving stations within the WLAN. Therefore, it would have been obvious to one of ordinary skills in the art to modify the teachings of Ohta to include the teachings of incorporating a PLCP frame format for transferring data between a MAC device and a receiving radio as taught by Lee in order to efficiently transfer frames between a MAC deice and a radio receiver regardless of the physical layer functionality of the receiving radio.

Referring to claim 2, Ohta discloses in figure 1wherein the first UFD module [first frequency converting circuit 2] receives the input RF signal [RF signal from antenna 1], wherein the first UFD module [first frequency module] down-converts [as disclosed in figures 1 and 4 and column17, lines 18-40] the input RF signal [RF signal from antenna 1] according to a first control signal [first quadrature signal] and outputs a first down-converted signal [as disclosed in figures 1, 4 and column 17, lines 18-40]; wherein the receiver further comprises: a second UFD

module [second frequency converting circuits 3 of figure 1] that receives the input RF signal [output of the first frequency converting circuit is an input to the second frequency converting circuit as disclosed in column 17, lines 18-40], wherein the second UFD module [second converting circuit 3 of figure 1] down-converts the input RF signal according to the second control signal [second quadrature signal] and outputs a second down-converted signal [as disclosed in figures 1 and 2 and column 17, lines 18-66]; and a subtractor module [common wave extracting circuit 5 of figure 1] that subtracts the second down-converted signal from the first down-converted signal and outputs a down-converted demodulated signal to [frequency offset circuit as disclosed in the abstract and figure 1, 16, 17 and column 17, lines 18-66] as claim.

Referring to claims 3 and 4, Ohta discloses in figure 1, column 17, lines 18-40 and in column 8, lines 15-63 wherein the first UFD module [first frequency converter 2 of figure 1] under-samples the input RF signal [signal received from antenna 1] according to the first control signal pulse by (½ ) cycles and the second UFD module under-samples the input RF signal according to the second control signal as claim.

Referring to claim 6, Ohta discloses in column 7, lines 25 to column 8, lines 4 wherein the first and the second UFD modules each comprise a switch and a storage element [first and second buffers], wherein a first node of the each switch is coupled to a node of the corresponding the each storage element, and a second node of the each switch is coupled to a reference potential as claim.

Referring to claim 8, Ohta discloses in column 7, lines 25 to column 8, lines 4, wherein the subtractor module comprises of a differential amplifiers [first and second integrating circuits,

serve additionally as low-pass filters, for correspondingly accepting outputs of the first and second differential amplifiers] as claim.

Referring to claims 28 and 32, Ohta discloses in column 18, lines 60-65, column 20, lines 46-52 that input RF signal comprises BPSK and QPSK. Ohta fails to discloses wherein the physical layer comprises a direct sequence spread spectrum (DSSS) physical layer. Lee discloses in the abstract of MAC device to transmit and receive data to and from the physical layer signaling control device. Lee further discloses in figure 1, column 3, lines 5-47 of 802.11 standard may work with any frequency hopping radios, direct sequence radios or infrared radios. Therefore, it would have been obvious to one of ordinary skill in the art to modify the teachings of Ohta to include incorporating RF signal in a DSSS physical layer radio in order to efficiently transfer frames between a MAC deice and a radio receiver regardless of the physical layer functionality of the receiving radio.

Referring to claim 42, Ohta discloses in column 18, lines 60-65, column 20, lines 46-52 and 19, lines 43-46 wherein the physical layer comprises an orthogonal frequency division multiplexing physical layer, wherein the output RF signal comprises a binary phase shift keying modulated signal, a quadrature phase shift keying modulated signal, a 16-QAM modulated signal or a 64-QAM modulated signal as claim.

Referring to claim 46, Lee discloses in claim 1, 8, and figure 1, wherein the MAC and the physical layer are comprised by a network adaptor or a network interface card.

Referring to claim 47 and 51, Ohta discloses in figure 1 and in column 17, lines 18-40, wherein the transmitter comprises a UFU module (upside frequency conversion), wherein the UFU module comprises a first universal frequency translation (UFT) module as claim.

Referring to claim 48 and 52, Ohta discloses in figure 1 and column 8, lines 35-50 wherein the UFT module [first frequency converter 2] is configured to amplitude modulate, frequency modulate, or phase modulate a carrier signal with an information signal as claim.

Referring to claim 49, Ohta discloses in figure 1, figure 5, column 8, lines 35-50 and column 25, lines 18 to column 26, lines 18 wherein the transmitter further comprises a second UFT module, wherein the first and second UFT modules are configured to modulate and up-convert information signals to in-phase and quadrature-phase channels as claim.

Referring to claim 50 and 54, Ohta discloses in figure 1 and column 8, lines 35-50 wherein the information signals are modulated and unconverted according to one of the modulation scheme as claim.

Referring to claim 53, Ohta discloses in figure 1, figure 5, column 8, lines 35-50 and column 25, lines 18 to column 26, lines 18, wherein the receiver further comprises a second UFT module, wherein the first and second UFT modules are configured to demodulate and down-convert information signals to in-phase and quadrature-phase channels as claim.

Referring to claim 55, Lee discloses of DSSS radio that includes 11 channels in the 2.4GHz frequency range in figure 1 and column 3, lines 5-14 wherein the UFD module is tuned for at least one frequency substantially equal to one of or between 2.402GHz and 2.495GHz.

Referring to claim 56, Ohta discloses in figure 1 wherein the device is an access point, computer, personal data assistant, telephone or combination thereof as claim.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 34 and 36 rejected under 35 U.S.C. 103(a) as being unpatentable over Ohta in view of Lee as applied to claims 1-4,6,8,28,32,42 and 46-56 above, and further in view of Brown et al (U.S. Patent No. 6,366,622).

Referring to claims 34 and 36, Ohta in view of Lee discloses output RF signal comprises a binary phase shift keying modulated signal, a quadrature phase shift keying modulated signal. Ohta in view of Lee also discloses of the physical layer comprising of a frequency hopping spread spectrum. Ohta in view of Lee fails to disclose of wherein the physical layer comprises a frequency hopping spread spectrum physical layer, wherein the output RF signal comprises a 2-level or 4-level Gaussian frequency shift keying modulated signal. Brown discloses in column 212, lines 25 to column 22, lines 8 of IEEE 802.11 radio being a 2.4 GHz radio transceiver and may process a 1Mbps Gaussian Filtered Frequency Shift Keying (GFSK). It would have been obvious to one of ordinary skill in the art to modify the teachings of Ohta in view of Lee to include the teachings of Brown with respect to GFSK in order to handle time-critical packet processing and frequency hoping and frame protocols.

***Allowable Subject Matter***

6. Claims 7, 9-16, 18-22, 24-26, 29-31, 33, 35, 37-39, 40, 41, 43-45 and 57-60 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

*Conclusion*

**Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks
Washington, D.C. 20231

**Or faxed to:**

(703)305-3988, (for formal communications intended for entry)

**Or:**

(703)305-3988 (for informal or draft communications, please label "Proposed" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2021 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist).
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chirag G Shah whose telephone number is 703-305-5639. The examiner can normally be reached on M-F 8:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wellington Chin can be reached on 703-305-4366. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

cgs
September 1, 2004

Ajit Patel
Primary Examiner